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14. ABSTRACT

Technological advancements in communications provide the operational commander with a significantly enhanced real-time understanding of the battlespace, enabling more robust employment of centralized control. However, along with its benefits, this command, control and communications (C3) network includes the dangerous consequence of eroding the autonomy of tactical command through enhanced micromanagement by risk-averse operational commanders.

Selected historical examples demonstrate that advances in C3 technology have been a force multiplier that enables the implementation of broader strategies by drastically improving the operational commander's understanding and control of the battlespace and battleforce. However, as exemplified by operations in Kosovo, technological advancement when put in the hands of risk-averse operational commanders can also serve as an enabler of potentially damaging micromanagement. This tendency is rapidly leading to an attrition of decentralized execution, which in a forgiving battlespace may appear insignificant, but could prove fatal to United States military efforts in a multi-dimensional large scale conflict. Fortunately, there are several noteworthy options to mitigate this risk including incentives, doctrine and training.

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THE UNSPOKEN CONSEQUENCE OF COMMAND, CONTROL COMMUNICATIONS
TECHNOLOGY: ENHANCED MICROMANAGEMENT BY RISK-AVERSE
COMMANDERS

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the
requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by
the Naval War College or the Department of the Navy.

Signature: _____

9 February 2004

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Abstract

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TECHNOLOGY: ENHANCED MICROMANAGEMENT BY RISK-AVERSE
COMMANDERS

Technological advancements in communications provide the operational

commander with a significantly enhanced real-time understanding of the battlespace,

enabling more robust employment of centralized control. However, along with its benefits,

this command, control and communications (C3) network includes the dangerous

consequence of eroding the autonomy of tactical command through enhanced

micromanagement by risk-averse operational commanders.

Selected historical examples demonstrate that advances in C3 technology have been a

force multiplier that enables the implementation of broader strategies by drastically

improving the operational commander's understanding and control of the battlespace and

battleforce. However, as exemplified by operations in Kosovo, technological advancement

when put in the hands of risk-averse operational commanders can also serve as an enabler of

potentially damaging micromanagement. This tendency is rapidly leading to an attrition of

decentralized execution, which in a forgiving battlespace may appear insignificant, but could

prove fatal to United States military efforts in a multi-dimensional large scale conflict.

Fortunately, there are several noteworthy options to mitigate this risk including incentives,

doctrine and training.

The art of effectively employing and coordinating military forces has necessarily evolved with technological advancement, one element of which is command, control and communications (C3). Since WWII, significant and increasingly rapid advances in C3 capabilities should have resulted in decisive victories in subsequent limited conflicts such as Vietnam, Kosovo and Afghanistan. However, limited success in these conflicts begs the question – what is wrong?

Technological advancement in communications provides the operational commander with significantly enhanced real-time understanding of the battlespace, enabling more robust centralized control. However, along with its benefits, in the hands of risk-averse operational commanders, advanced C3 can also serve as an enabler of potentially damaging micromanagement.

Selected historical examples demonstrate that advances in C3 technology have been a force multiplier that enables the implementation of broader strategies by improving the operational commander's understanding and control of the battlespace and battleforce. Conversely, as exemplified by operations in Kosovo, this propensity can have the detrimental consequence of eroding decentralized execution and autonomy of command – a trend which will greatly reduce the combat effectiveness of tactical commanders, potentially leading to failure in U.S. military efforts against more formidable opponents. Fortunately, there are several noteworthy options to mitigate this risk including incentives, doctrine and training.

Historical model

Prior to the 19th century, limited C3 capability often restricted the employment of forces to small-scale maneuvers where strategy and tactics were directed by the same commander.[1] Commonly, the strategic commander was also the tactical commander, greatly simplifying the C3 requirements. Generally, military leaders gained the majority of their

strategic intelligence from reading books, maps and newspapers.[2] Human intelligence, while contributing to battlefield decision-making, was a distant second to the leader's knowledge. Therefore, centralized execution was not only a preference of the military leader, but also a necessity, as there were no reliable channels for long-distance C3. In the age of communications through messenger, the potential of C3 innovation to enhance centralized control and execution were demonstrated by Frederick the Great's employment of a central headquarters which overlooked the battlefield.[3] This concept afforded the strategic-operational commander a more accurate, real-time macro-picture of the battlespace.

Napoleon

The capacity of the strategic commander to employ the concept of centralized tactical execution was exceeded by Napoleon at the battle of Jena.[4] The unprecedented size and complexity of the factors space, time and force resulted in Napoleon's inability to directly observe or control the entire battlespace and battleforce. With forces operating in a geographically dispersed battlefield, Napoleon was only able to keep track of two of the five engaged Army corps.[5] Napoleon's forces were victorious in this series of simultaneous engagements because he organized his forces around a centralized system that permitted short-term decentralization of command supported by a series of regular reports and orders between each corps commander and the Imperial General Headquarters.[6]

The battle of Jena offers an example where the technologically limited capabilities of Napoleon's C3 required employment of a more capable command and control model. The simultaneous series of battles, over a large geographic area, employing unprecedented force magnitude led to decentralized execution of strategic objectives. Napoleon's success lay not only in his ability to think strategically, but equally in the trust and confidence he afforded his individual unit commanders. He created a command climate in which his subordinate

commanders were permitted to exercise their tactical judgment.[7]   The broad space, time and

force considerations at Jena serve as proof of concept for the employment of operational

commanders to translate strategic objectives into operational objectives and to successfully

link the operational objectives to tactical execution. Napoleon's advance to the next level of

coordinated warfare was stifled by a lack of supporting C3 technology; his ability to fully

employ art in warfare planning and execution preceded the technology required to enable its

complete application.

WWII

Victory in a large scale multi-dimensional conflict against a formidable opponent

requires a delicate balance between centralized operational control and decentralized tactical

execution. During WWII, Japanese commanders in the Pacific were frustrated and

frequently hampered designing and employing strategies and tactics to combat the United

States due in part to the effective balance of centralized operational control coupled with the

freedom of decentralized execution afforded subordinate commanders by Admiral Nimitz.

As demonstrated in the Pacific at the Battle of Leyte Gulf, Admiral Nimitz's

communiqué to Admiral Halsey, "where is task force 73…," offers an example of an

operational commander using C3 to maintain centralized control of the battlespace while still

affording his tactical commanders the freedom to execute their objectives.[8] Admiral Halsey

was given the flexibility to choose the most effective tactical employment of his battle forces,

as in his maneuver to attack the Japanese carriers to the North of Leyte. C3 technology

enabled Nimitz to gain a clear picture of the battlespace and when advantageous,

operationally re-deploy military resources as at Leyte when he was able to effectively

redirect Halsey's forces away from the enemy's deception and toward the central objective.

By providing the operational commander the ability to maintain an accurate understanding of the battlespace, C3 facilitated centralized control with decentralized execution.

Post WWII Transition to Modern C3

The Korean War marked a shift in the U.S. war fighting philosophy from that of achieving unlimited objectives through the employment of total resources to one of limited objectives using only partial resources. Even more importantly, it marked a shift from entering conflict in direct defense of the United States to one of engaging in conflict to prevent future aggression against the U.S. through a policy of active containment. This less direct threat to U.S. sovereignty resulted in an American society less willing to accept a loss of life in war. Furthermore, a post-Cold War shift in U.S. policy, to one that champions human dignity, has resulted in U.S. involvement in support of humanitarian and ethical disputes in nations such as Kosovo.[9] The limited objectives in these conflicts coupled with the American populace's aversion for battlefield loss of life has instilled a culture of risk-averse decision making in both the political and military communities.

Korea and subsequent conflicts offer examples of the impact of the evolution of C3 in American war fighting doctrine, which will not be directly addressed in this argument. However, the conflict in Kosovo offers a recent example where significant technological advances in C3 made a powerful tool available which U.S. and NATO leaders were not prepared to effectively integrate into their decision making process.[10] Even though C3 proved an enabler for strategic and operational commanders, it also brought negative consequences which prolonged the effort to oust Serbian leader Slobodan Milosevic.

Consequences of C3

Technological advancements in C3 facilitated high intensity precision air strikes; however, implementation of this technology preceded development of sufficient doctrine and

4

training to most effectively employ these powerful communications tools during the war in

Kosovo. While making possible an unprecedented 38,000 air sorties in just 78 days, the U.S.

led mission in Kosovo provides numerous examples of how excessive C3, when ineffectively

employed by strategic and operational commanders, can dramatically reduce the

effectiveness of superior and overwhelming combat forces.[11]

Strategic leaders entered the conflict in Kosovo with the conviction that technological

superiority, including significant advances in C3 since the 1991 Gulf War, would enable

them to rapidly achieve their objective of forcing Milosevic to step down using limited

military resources.[12] President William J. Clinton and NATO leaders desired to

diplomatically coerce Milosevic to concede to NATO demands by an attrition strategy

through a "carefully orchestrated aerial campaign."[13] C3 enabled the ultimate achievement

of the strategic objectives; however, along with the beneficial capabilities of C3 came

numerous side effects, the more significant of which include political micromanagement, risk

aversion and virtual command. Each of these consequences distinctly hindered the efficient

accomplishment of strategic and operational objectives by leading to plans which were based

on political and individual "desires rather than the reality of the situation..."[14] This

environment led strategic and strategic-operational commanders to misconstrue the true

nature of the war as one which could be won through simple diplomatic coercion instead of

by directly threatening Milosevic's sources of power and strength.[15]

Political micromanagement

Substantial political involvement in the target approval process was evident not only

within the U.S. Observe, Orient, Decide and Act (OODA) loop, but also in those of the other

NATO nations.[16] A loose application of NATO alliance forces from the beginning,

operations in Kosovo had no formal sanctions from the United Nations or the legislatures of

the nations involved.[17] Therefore, this was not an alliance operation but rather a more

tenuous coalition of alliance nations, which required not only increased diplomatic efforts,

but also significant military operational staff attention to maintain cohesion.   This fragile

political foundation led to a rapid increase in political micromanagement of targeting by

strategic and operational commanders; any mistake had the potential to critically damage the

coalition. Maintaining this precarious coalition was a priority which greatly influenced the

military decision making processes of the U.S./NATO commander, General Wesley Clark.[18]

While political agendas frequently affect the conduct of conflict, in the case of

Kosovo, the requirement to minimize NATO and civilian casualties led directly to a strategy

of employing airpower while avoiding the use of ground troops.[19] Advances in C3 enabled

more robust involvement of strategic leaders in the target approval process, which had the

benefit of ensuring unity of political and military objectives but also had the negative

consequence of hindering operational and tactical battlefield effectiveness. C3 provided U.S.

and NATO leaders with an omniscient real time picture of the battlespace. This robust

picture of the battlespace, when coupled with political agendas and the advanced C3

capability to quickly communicate direction to operational commanders, led to a greater

involvement than ever before by strategic leaders in the target approval process.

Embroiled in misconduct allegations, which would lead to impeachment proceedings,

President Clinton's personal and political agendas further shaped the requirement that the

objective in Kosovo be attained while maintaining popular domestic and international

support.[20] A significant strategic implication of these constraints was that the objective in

Kosovo would have to be achieved through a complex coalition of NATO nations and United

Nations diplomacy. Advances in C3 were seen by strategic leaders as a viable method for

ensuring that all elements of this effort were assimilated. C3 effectively eliminated much of

the "fog of war" for strategic commanders. However, in the hands of risk-averse

commanders, this C3 capability resulted in a blurring of the division between strategic,

operational and tactical targets, which decreased the combat effectiveness of coalition forces.

     The initial plans for C3 provided the strategic-operational commander, General

Clark, SACEUR/USCINCEUR (see appendix A), target approval authority in conjunction

with the NATO targeting counsel.[21] However, this military flexibility was impaired when

Washington introduced a "target by target" approval process.[22] This decision, whether

initially intended to minimize collateral damage, impose constraints on the judgement of

SACEUR or a combination of both concerns, was gradually adopted by other NATO leaders,

including the United Kingdom and France.[23] As more and more strategic leaders recognized

the capability of American C3, their involvement in the target approval process increased;

further hindering the timeliness of operational fires. Targets previously authorized for

approval by SACEUR, such as petroleum storage, ammunition storage and electric power

facilities, were further restricted to strategic approval by Washington.[24] Additionally, all

targets to be engaged by any NATO forces flying out of UK airfields required approval of

British lawyers.[25] Similar restrictions were gradually imposed on operational and tactical

targeting by France and other NATO partners.[26] President Chirac of France even boasted

after the war that "if there were bridges still standing in Belgrade, it was thanks to him."[27]

These restrictions protracted the conflict as they led to damaging delays in targeting

Serbian critical strengths. One such example is the two month delay in obtaining approval to

target Milosevic's headquarters and command bunkers, which significantly protracted the

conflict.[28] General Michael Short and his Combined Joint Air Forces Component Command

(CJFACC) staff had strongly argued that applicable Air Force doctrine, to strike government

ministries, television stations, electrical plants, command centers and other institutions which

Milosevic used to run the country and maintain his hold on power, be followed from the outset of the conflict.[29] However, their recommendations were disregarded by Clark for weeks, while he focused the efforts on what he considered to be an easy to define and safe target, the Serbian 3rd Army.[30]

Risk Aversion

In many previous conflicts, exemplified by but not limited to the examples of Jena and Leyte Gulf, the extent to which commanders could exercise centralized control was often limited by C3 capabilities; therefore operational and tactical commanders were necessarily afforded the flexibility of decentralized execution. Strategic commanders had to trust their operational commanders to balance political and military objectives. Similarly, C3 limitations required that operational commanders trust the judgment of their tactical commanders to execute operations in accordance with the commander's intentions. In the Kosovo conflict, more robust C3 afforded strategic and operational leaders the ability to clearly observe and readily exercise remote centralized control over the battlespace. This enhanced capability not only led to centralized control with centralized execution, thereby reducing the military flexibility of subordinate commanders, but also served to further slow the decision making cycle of time sensitive targeting in Kosovo, including precision air strikes and employment of Task Force Hawk.

As the Kosovo conflict became protracted, risk aversion led strategic and operational leaders to exert an even higher level of micromanagement to targeting. After reviewing the recommendations of the joint targeting council and choosing operationally significant targets, Clark would direct the CJFACC, to screen the targets to ensure that they would contribute to the following measures of success: "protect NATO forces in theater; hold the Coalition together; and not to lose any airplanes or any pilots."[31] The overarching focus and decision

making process emphasized these elements rather than focusing on efficiently employing the available forces to accomplish military objectives. Nevertheless, this restrictive and conservative targeting process was unable to eliminate operational errors with strategic implications as demonstrated by the mistaken bombing of the Chinese Embassy. This targeting error resulted in additional restrictions on the operational planning staff, by Clark, further hampering military effectiveness.[32]

The negative consequences of robust C3 capabilities contributing to risk aversion by the operational commander were further exemplified by the restricted employment of Apache helicopters.[33] In an effort to appease strategic leaders, Clark departed from approved training and doctrine and from the recommendations of his planning staff by employing Apache helicopters, Task Force Hawk, independently instead of in support of ground troops.[34] Not only did this prove ineffective, it resulted in another example of tactical and operational fires being controlled by strategic leaders. Apache engagements required approval from Washington, a process which generally took 96 hours; a delay which frequently reduced or eliminated the operational relevance of the target and eliminated the ability of commanders to employ the Apache in a tactical role.[35]

Furthermore, Clark's personal political concerns increasingly guided his military planning. His concern for being held personally accountable for civilian casualties led him to become more "deeply involved in the [targeting] process."[36] Even though frequently advised by his staff of the need to integrate ground forces along with precision air strikes, under daily video teleconference (VTC) pressure to avert casualties from President Clinton and leaders of major NATO states, he made only a limited effort to convince them of the value inherent in this concept of operations.[37] The foremost personal concern of being held politically accountable for casualties was also clearly observed in his actions after receiving private

advice from Secretary of State Madeline Albright, who warned him of the potential political consequences he may face if he continued to press for politically risky ground operations: "… they've turned on me. Now they'll turn on you."[38]

General Clark created an environment for planners that was not conducive to success. His advisors became so embroiled in the potential political consequences that they became risk-averse in decision making; a condition which resulted in a planning staff that was a direct conduit between the strategic and tactical levels of warfare instead of advisors and operational planners.[39] As a result, the operational level of command was rendered less effective, which will subsequently be demonstrated to have prolonged the conflict.

Virtual Command

C3 technology has resulted in the operational commander frequently having a better overall understanding of the field of battle than the tactical commander.[40] Current C3 technology permits the operational commander to lead from remote locations while maintaining a near-real-time understanding and control of the battlespace. This technology, if not properly regulated by the operational commander, has a tendency to blur the division between centralized operational control and decentralized tactical execution.[41] Evidence from Kosovo demonstrates that political and personality influences can lead to decreased military effectiveness; victory was achieved, but at a greater cost due to this less efficient employment of available forces. Virtual command negatively impacted military effectiveness by contributing to the failure to accurately identify and target Serbian critical strengths including the center of gravity, Slobodan Milosevic, and the sources of his power and strength.[42]

Virtual command allows for a geographic separation of the operational commander and his staff from the field of battle, thereby eliminating many elements of interpersonal

contact with military and civilian forces in theater. With effort, it is possible for commanders to compensate for this gap; however, if not recognized and dealt with effectively, this separation can turn the conflict into a "video game" where the consequences of ineffective decisions are diluted to such a point that they are no longer recognized by the commander or his advisors. In the case of Kosovo, both strategic and operational leaders were intimately involved in the target decision making process from their host nations and remote bases of operation. The consequence of this geographic separation was that political interests and risk aversion outweighed the effective employment of operational art in military planning.

In a robust and untested C3 environment, where strategic and operational commanders were learning to employ technology devoid of sufficient doctrine, the operational commander provided limited value added. Clark's focus on the war was "virtual rather than visceral" and as a "virtual commander" he provided little insulation between the strategic and tactical levels of execution."[43] Every time there was a decision to be made, SACEUR used a VTC or secure telephone to discuss the political ramifications with strategic leaders, often neglecting to leverage the expertise of his staff and subordinate commanders.[44]

Ethnic cleansing was the popular thread that unified U.S. and NATO nations in support of their effort to oust Milosevic. The majority of ethnic cleansing operations had occurred prior to the start of hostilities.[45] The political and personality influences previously discussed appear to have led U.S. and NATO leaders to incorrectly define the Serbian 3rd Army, which had executed the ethnic cleansing efforts, as the Serbian center of gravity in this effort. The 3rd Army was an easy to define and relatively risk free target. It could be easily identified, flushed out by coordination with KLA ground forces and could be targeted with minimal risk of collateral damage and civilian casualties. The "virtual commanders," including President Clinton, General Clark and the leaders of coalition nations, were

comfortable with this target and being so geographically isolated from the conflict, lost sight of the critical strengths and sources of Milosevic's power; choosing rather to focus on the 3rd Army as a target of convenience.

With the objective of removing Milosevic from power, military targets should have been focused on those which attacked the more significant sources of Milosevic's power, the 80,000-100,000 troops of the Ministry of the Interior, his inner circle of influential supporters and the critical resources on which they relied.[46]   Milosevic was supported by a substantial minority of powerful Serbian citizens who derived their influence from resources located in and around the capital of Belgrade, including military and civilian fuel supplies, communications infrastructure, electrical power, transportation bridges and factories.[47] Not until the coalition began attacking these sources of Milosevic's power and strength, during the final few days of the conflict, was the Serbian leader compelled to step down.[48]

C3 technology empowered and enhanced the negative aspects of micromanagement, risk-averse personalities and hazards inherent in virtual command to such a point that the majority of air strikes were not targeted at the center of gravity nor critical strengths, but rather were squandered while ensuring that the underlying non-military objectives of strategic and operational leaders were met. As the effects of this risk aversion began to manifest themselves in a protracted conflict, General Short was compelled to speak outside of the chain of command and press for a more focused effort against Milosevic's sources of power and strength. As he described in an interview with journalists:

> At the same time that I am executing SACEUR's number one priority – killing the Army in Kosovo, I also need to strike at the leadership and the people around Milosevic to compel them to change their behavior in Kosovo and accept the terms NATO has on the table.[49]

Ultimately, the U.S. lead NATO coalition was successful in removing Milosevic from power by focusing efforts against the critical strengths and sources of Milosevic's power, but only after inefficiently expending significant and expensive military resources.

Recommendations for Mitigating Future Risk

Effective employment of continually advancing C3 capabilities, by strategic and operational commanders, will require active steps to mitigate the risks inherent in this technology. Historically, the U.S. has ultimately prevailed in most conflicts by "wearing down the enemy by being bigger, not smarter."[50] Recent conflicts such as Desert Storm, Bosnia, and Operation Iraqi Freedom demonstrate conflicts where forgiving battlefields combined with formidable U.S./NATO forces led to the defeat of a less capable enemy. However, as peer competitor military prowess advances and internal U.S. economic and political pressures continue to result in a more streamlined American force structure, the advantages afforded by forgiving battle fields and overwhelming force structures will diminish. This trend will require extremely efficient employment of limited resources. More effective integration of C3 technology into military planning and execution will require more risk tolerant leadership, improved doctrine and refined training of officers.

Risk Tolerant Leadership

Success in supporting the trend toward crisis response conflict, dictated by the 2002 National Security Strategy, requires that operational and tactical leaders be permitted to take calculated risks in order to accomplish their missions.[51] General MacArthur was personally willing to and afforded the flexibility by strategic leaders to embark on the high risk operational maneuver into Inchon, Korea.[52] Like Clark in Kosovo, MacArthur demonstrated personal political ambition, however unlike U.S. and NATO coalition leaders in Kosovo, he and his strategic leaders took the operational risk of employing ground forces in a long

distance maneuver with a high risk of casualties. In the case of Kosovo, attrition warfare was

adopted instead of maneuver warfare, as it was considered to be less risky. However, the U.S.

failure of the attrition strategy in Vietnam should have provided a strong case against this

risk-averse strategy of warfare for military planners in Kosovo.

High tempo maneuver warfare, frequently associated with "crisis response," requires

operational leaders to take calculated risks.[53] The growing trend toward these less well

advance-planned, "war gamed" and tested crisis operations will require centralized control

and the flexibility of decentralized execution. Even more than in the case of deliberately

planned operations, as delineated in the Contingency Planning Guidance and the Joint

Strategic Capabilities Plan, the success of crisis action will depend on top-down guidance

toward a tolerance for error, permitting operational and tactical commanders to take

calculated risks in accomplishing their fast-reaction missions.

Current C3 affords the operational commander an unprecedented, accurate, real-time

picture of the battlespace along with greater control of forces. However, along with this

"power," the operational commander must be conscious of and willing to accept the risk and

responsibility of this capability. The operational commander must make a concerted effort to

balance C3 enabled fast paced changes in strategic guidance with the effective operational

employment of forces. The operational commander is not only an executer of national

strategy and controller of operational employment, but should also be an enabler and

"protector" of decentralized tactical execution. Centralized control supports the "science of

war," but the decentralized execution permits successful application of the "art of war."

In order to further support the effective application of decentralized execution,

military leaders should be rewarded for calculated risk-taking and not for risk aversion. The

line between the two tends to be blurred by political, but not necessarily strategic,

considerations. Zero-defects leadership stifles the application of the "art of war." Selfless leadership and a commitment to country and service affords the higher commander with the means to ensure that his subordinates are encouraged to and rewarded for taking calculated risks in the execution of their military objectives.

Doctrine and Training of Officers

Advances in C3 have outpaced the development of doctrine and the subsequent training of officers to integrate the power of this technology into the most effective employment of military forces.   As demonstrated by the Kosovo case, this deficiency in appropriate doctrine and training can permit the inefficient use of this technology.[54] In the face of continuously and rapidly advancing C3 capabilities, military commanders must habitually train to intellectually contend with uncertainty and risk.[55] A "cultural revolution" in training is required in which "thoughts, practices and the environment mold the minds of officers" who are being prepared for warfare, assisted but not controlled by technology.[56]

As span of control continues to increase, operational commanders are more effectively able to exercise "command-by-plan," a clearly scripted course of action in which they are able to create and disseminate a vision of how events will unfold before the battle begins.[57] Once the battle commences, C3 along with C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) provides the operational commander with a real-time understanding of the changing face of the battlefield, permitting him to adjust and rapidly disseminate revised concept of operations (COA). However, the operational commander and his staff must exercise restraint by permitting decentralized execution of his COA by tactical commanders. No matter how current or accurate the operational picture, technology also results in information overload where the operational commander's span of control can quickly be exceeded if this information is not

efficiently managed. Delegation of execution authority affords the operational commander

with the tools necessary to maintain a broad span of control required by more streamlined

military forces in ever increasingly geographically distributed crisis operations.

While much of the responsibility for training and maintaining an environment which

affects the balanced employment of C3 lies with the operational commander, external

training must also be tailored to support the same ends. Service War Colleges afford the

opportunity to both transition young officers from the tactical to the operational phases of

their careers while simultaneously developing their leadership and management skills to most

effectively employ current technology (including but not limited to C3) into their

employment of the "art of war."[58] American Military Services place an emphasis on earning

degrees of higher education, but unlike their international counterparts, do not focus this

effort uniformly, across the Services, toward military education and the "art of war".[59] While

there is great personal and professional value in earning degrees of higher education in a

wide range of fields, the operational implications of rapidly advancing C3 capabilities make

it imperative that the preponderance of military officers also be trained in the most effective

application of these tools prior to embarking on the operational phase of their careers.

Some have argued that the present system of Service colleges should be exchanged

for a single National Defense University.[60] However this revised training curriculum could

be more effectively and widely communicated across the Services by developing and

implementing standardized curricula throughout all Service colleges which emphasizes C3

employment in support of centralized control and decentralized execution.[61] Students should

be encouraged to actively research and develop thesis and doctrine for the effective

operational employment of rapidly changing C3. Additionally, the more noteworthy of the

ideas generated should be chosen by academic panels and tested in war game style scenarios

across the various Service schools. An enhanced emphasis on joint military education,
doctrine development and operational employment of C3 will well serve the U.S. military.

Conclusion

Technological advancements in C3 can eliminate much of the "fog of war" and afford
the operational commander with greater flexibility and a wide range of options for improving
the effective employment and coordination of space and force in achievement of military
objectives and more efficiently employing limited military resources. Conversely, if managed
ineffectively by the operational commander, this same C3 technology can lead to reductions
in the efficiency and effectiveness of military forces employment.

Commanders have failed to realize the potential of C3 toward achieving their
objectives due in part to inappropriately applying this technology toward the ends of
eliminating risk. C3 capabilities have come to be used by risk-averse political and
operational commanders as micromanagement tools to protect their personal and political
objectives to the detriment of military effectiveness. This trend has eroded the time-proven
application of centralized control with decentralized execution proving prejudicial to
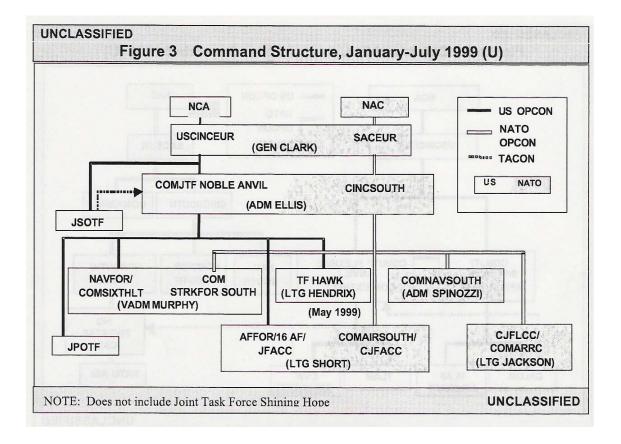achievement of objectives in recent conflicts such as Kosovo.

Negative consequences, such as risk aversion, can be reduced by an added top-down
tolerance for calculated risk. Furthermore, a performance based award and promotion system
that rewards commanders who effectively apply calculated risk toward the achievement of
military objectives must replace the commonly observed system which rewards the less
effective employment of politically attractive risk-averse decision making. Extremes of
micromanagement and misapplication of robust C3 capabilities can be reduced by a more
focused emphasis on standardized graduate level warfare training. Additionally,

misapplication of C3 can be further negated by implementation of control measures such as doctrine and system protocol.

Ultimately, training, doctrine and incentives will enhance the effectiveness of C3 integration, but the personality and leadership traits of the operational commander will ultimately determine how effectively this technology is integrated into the operational art of warfare toward the achievement of military objectives. The forgiving battlefields of recent conflicts have afforded commanders the opportunity to experiment with the application and misapplication of C3 in a relatively low-risk environment. Failure to maximize the effective employment of C3 in future conflict against more formidable, multi-dimensional adversaries, would likely prove detrimental to achieving U.S. objectives.

Appendix A

Kosovo Command and Control[62]

UNCLASSIFIED

Figure 3   Command Structure, January-July 1999 (U)

NCA

NAC

USCINCEUR
(GEN CLARK)

SACEUR

— US OPCON
— NATO OPCON
▫▫▫ TACON

US   NATO

COMJTF NOBLE ANVIL
(ADM ELLIS)

CINCSOUTH

JSOTF

NAVFOR/
COMSIXTHLT
(VADM MURPHY)

COM
STRKFOR SOUTH

TF HAWK
(LTG HENDRIX)
(May 1999)

COMNAVSOUTH
(ADM SPINOZZI)

JPOTF

AFFOR/16 AF/
JFACC
(LTG SHORT)

COMAIRSOUTH/
CJFACC

CJFLCC/
COMARRC
(LTG JACKSON)

NOTE: Does not include Joint Task Force Shining Hope

UNCLASSIFIED

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